

Génie des Télécommunications et Réseaux

Rapport DHCP-NIS

Sous UBUNTU



Réalisé par :

Youssef Mseguem

Encadré par :

Prof : Mediafi

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La configuration de serveur dhcp:

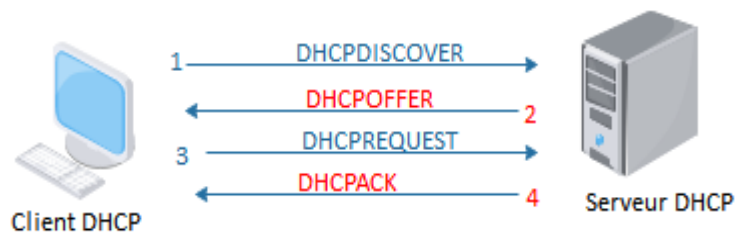
Présentation du service DHCP :

Le protocole **DHCP** (Dynamic Host Configuration Protocol (en) : « Protocole de configuration dynamique des hôtes » (Fr)) est un service réseau TCP/IP. Il permet aux ordinateurs clients l'obtention automatique d'une configuration réseau. Il évite la configuration de chaque ordinateur manuellement. Les ordinateurs configurés pour utiliser DHCP n'ont pas le contrôle de leur configuration réseau qu'ils reçoivent du serveur DHCP. La configuration est totalement transparente pour l'utilisateur.

Fonctionnement du service DHCP :

L'attribution d'une adresse à un nouveau poste nécessite l'envoi de 4 messages :

- DHCPDiscover : pour localiser les serveurs DHCP disponibles
- DHCPOffer : réponse du serveur à un paquet DHCPDISCOVER, qui contient les premiers paramètres
- DHCPRequest : requête diverse du client pour par exemple prolonger son bail
- DHCPACK : réponse du serveur qui contient des paramètres et l'adresse IP du client



Installation du service DHCP :

A l'aide de la commande : **apt-get install isc-dhcp-server**

Configuration de l'interface enp0s8 du serveur DHCP :

```
dhcp [En fonction] - Oracle VM VirtualBox
GNU nano 6.2 /etc/network/interfaces *
# interfaces(5) file used by ifup(8) and ifdown(8)
# Include files from /etc/network/interfaces.d:
source /etc/network/interfaces.d/*

auto enp0s8
iface enp0s8 inet static
address 192.168.1.2
netmask 255.255.255.0
gateway 192.168.1.1
```

Configuration du serveur DHCP :

Consultation de /etc/dhcp/dhcpd.conf qui contient les configurations de base, dans ce fichier on j'ai créé 2 étendues :

```
dhcpc [En fonction] - Oracle VM VirtualBox
GNU nano 6.2 /etc/dhcp/dhcpd.conf *
# range 10.5.5.26 10.5.5.30;
# option domain-name-servers ns1.internal.example.org;
# option domain-name "internal.example.org";
# option subnet-mask 255.255.255.224;
# option routers 10.5.5.1;
# option broadcast-address 10.5.5.31;
# default-lease-time 600;
# max-lease-time 7200;
#}
subnet 192.168.1.0 netmask 255.255.255.0 {
    range 192.168.1.20 192.168.1.30;
    option routers 192.168.1.1;
    option broadcast-address 192.168.1.255;
    default-lease-time 600;
    max-lease-time 7200;
}
subnet 192.168.2.0 netmask 255.255.255.0 {
    range 192.168.2.20 192.168.2.30;
    option routers 192.168.2.1;
    option broadcast-address 192.168.2.255;
    default-lease-time 600;
    max-lease-time 7200;
}
```

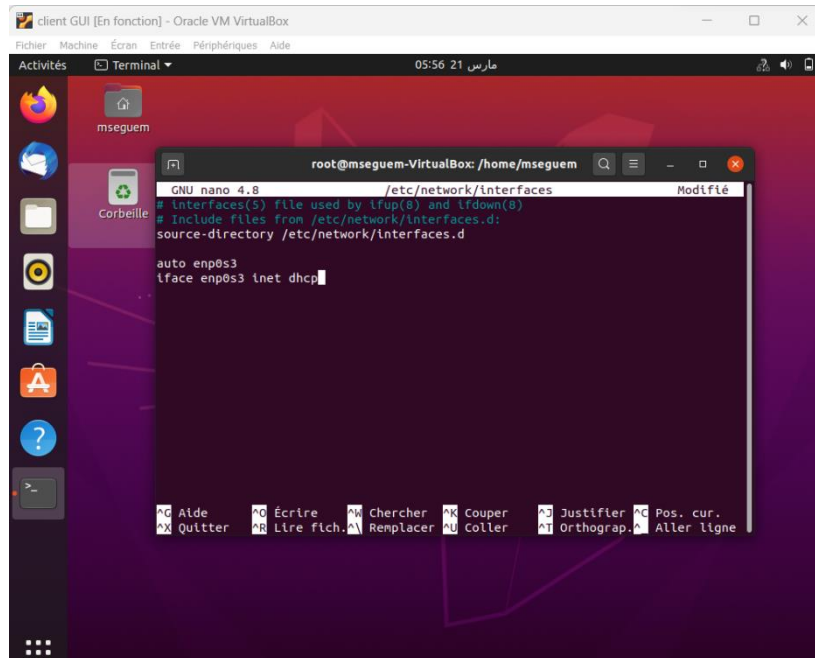
Après la configuration on doit redémarrer le service DHCP

```
root@dhcp:/home/youssef# /etc/init.d/isc-dhcp-server restart
Restarting isc-dhcp-server (via systemctl): isc-dhcp-server.service.
root@dhcp:/home/youssef# /etc/init.d/isc-dhcp-server status
• isc-dhcp-server.service - ISC DHCP IPv4 server
   Loaded: loaded (/lib/systemd/system/isc-dhcp-server.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-03-21 02:05:09 UTC; 4s ago
     Docs: man:dhcpd(8)
  Main PID: 2966 (dhcpd)
    Tasks: 4 (limit: 2221)
   Memory: 4.5M
      CPU: 11ms
   CGroup: /system.slice/isc-dhcp-server.service
           └─2966 dhcpd -user dhcpd -group dhcpd -f -4 -pf /run/dhcp-server/dhcpd.pid -cf /etc/dh...

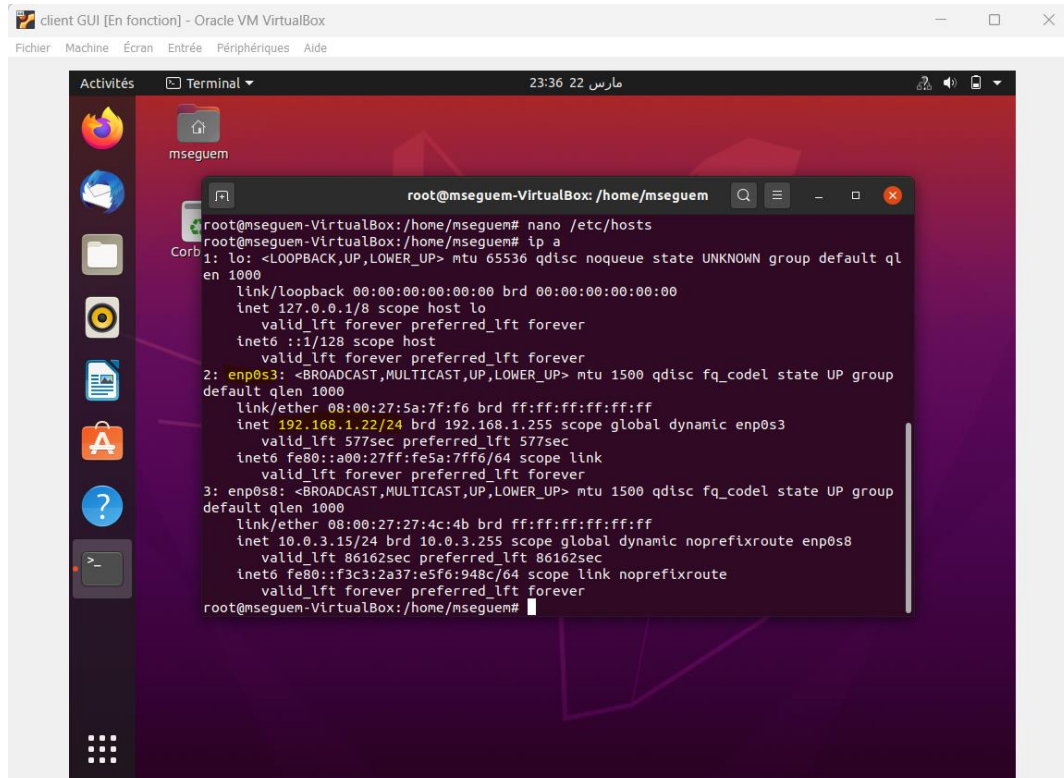
mars 21 02:05:09 dhcp dhcpd[2966]: you want, please write a subnet declaration
mars 21 02:05:09 dhcp sh[2966]: you want, please write a subnet declaration
mars 21 02:05:09 dhcp dhcpd[2966]: in your dhcpd.conf file for the network segment
mars 21 02:05:09 dhcp sh[2966]: in your dhcpd.conf file for the network segment
mars 21 02:05:09 dhcp dhcpd[2966]: to which interface enp0s3 is attached. **
mars 21 02:05:09 dhcp sh[2966]: to which interface enp0s3 is attached. **
mars 21 02:05:09 dhcp dhcpd[2966]:
mars 21 02:05:09 dhcp dhcpd[2966]: Sending on Socket/fallback/fallback-net
mars 21 02:05:09 dhcp sh[2966]: Sending on Socket/fallback/fallback-net
mars 21 02:05:09 dhcp dhcpd[2966]: Server starting service.
```

Configuration du service DHCP (Client-sous-réseau1) :

Après nous avons changé la configuration de la machine cliente pour qu'elle prenne une adresse IP automatiquement auprès de serveur DHCP :



Après nous avons tapé la commande **dhclient** pour Obtenir une adresse IP.



Réservation d'une adresse pour le serveur NIS :

```
dhcp [En fonction] - Oracle VM VirtualBox
GNU nano 6.2 /etc/dhcp/dhcpd.conf *
# fixed-address fantasia.example.com;
#}
host nis {
    hardware ethernet 08:00:27:1c:99:8f;
    fixed-address 192.168.1.5;
    option routers 192.168.1.1;
}
# You can declare a class of clients and then do address allocation
# based on that.  The example below shows a case where all clients
# in a certain class get addresses on the 10.17.224/24 subnet, and all
# other clients get addresses on the 10.0.29/24 subnet.

#class "foo" {
# match if substring (option vendor-class-identifier, 0, 4) = "SUNW";
#}
#}
```

Coté NIS

Configuration de l'interface enp0s8 du serveur NIS :

```
nis [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
GNU nano 6.2 /etc/network/interfaces *
# interfaces(5) file used by ifup(8) and ifdown(8)
# Include files from /etc/network/interfaces.d:
source /etc/network/interfaces.d/*

auto enp0s8
iface enp0s8 inet dhcp_
```

Adresse ip a été affecté avec succès :

```
nis [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
root@nis:/home/youssef# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:dd:a0:a3 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 metric 100 brd 10.0.2.255 scope global dynamic enp0s3
        valid_lft 85708sec preferred_lft 85708sec
    inet6 fe80::a00:27ff:fedd:a0a3/64 scope link
        valid_lft forever preferred_lft forever
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:1c:99:8f brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.5/24 brd 192.168.1.255 scope global dynamic enp0s8
        valid_lft 568sec preferred_lft 568sec
    inet6 fe80::a00:27ff:fe1c:998f/64 scope link
        valid_lft forever preferred_lft forever
root@nis:/home/youssef#
```

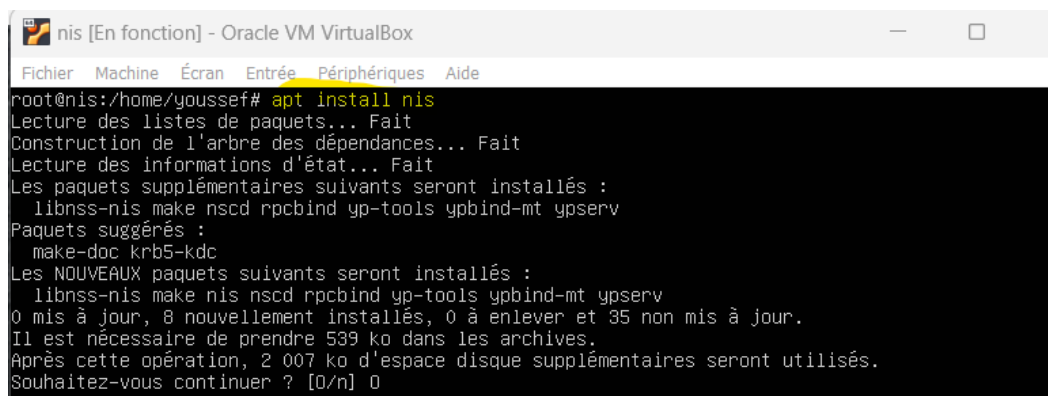
La configuration de serveur NIS :

Présentation du service NIS :

NIS a pour but « de distribuer les informations contenues dans des fichiers de configuration contenant par exemple les noms d'hôte (/etc/hosts), les comptes utilisateurs (/etc/passwd), etc. sur un réseau ». Un serveur NIS stocke et distribue donc les informations administratives du réseau et qui se comporte ainsi comme un ensemble cohérent de comptes utilisateurs, groupes, machines, etc.

Installation du service DHCP :

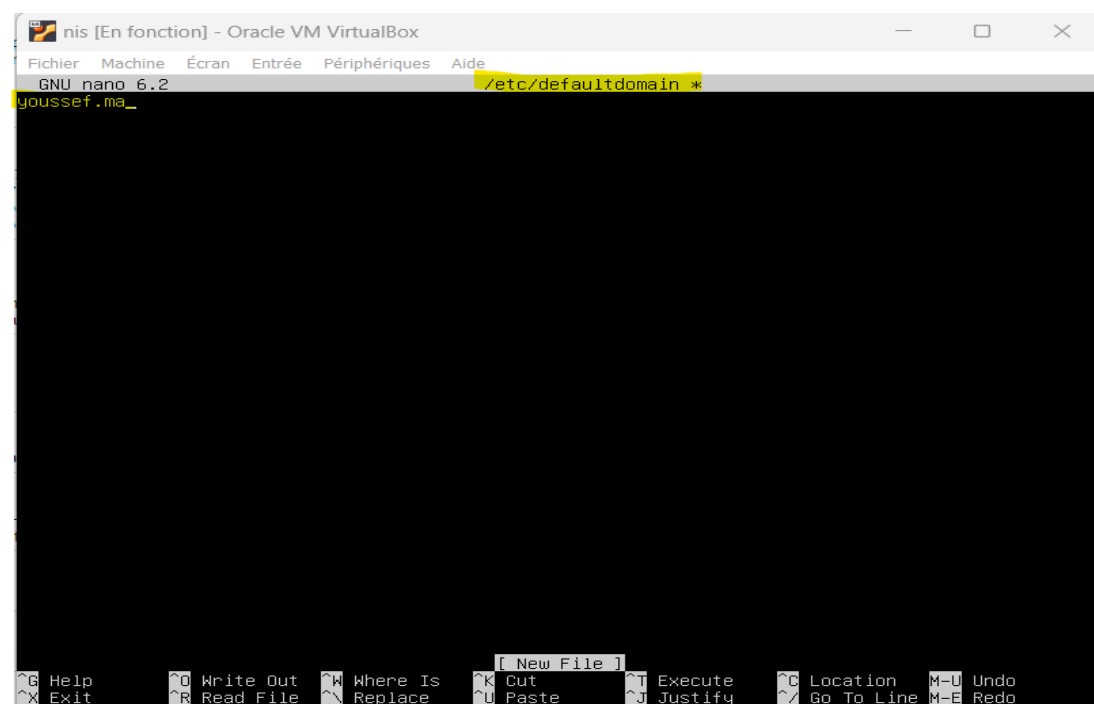
A l'aide de la commande : **apt-get install nis**



```
nis [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
root@nis:/home/youssef# apt install nis
Lecture des listes de paquets... Fait
Construction de l'arbre des dépendances... Fait
Lecture des informations d'état... Fait
Les paquets supplémentaires suivants seront installés :
  libnss-nis make nscd rpcbind yp-tools ypbind-mt ypserv
Paquets suggérés :
  make-doc krb5-kdc
Les NOUVEAUX paquets suivants seront installés :
  libnss-nis make nis nscd rpcbind yp-tools ypbind-mt ypserv
0 mis à jour, 8 nouvellement installés, 0 à enlever et 35 non mis à jour.
Il est nécessaire de prendre 539 ko dans les archives.
Après cette opération, 2 007 ko d'espace disque supplémentaires seront utilisés.
Souhaitez-vous continuer ? [O/n] O
```

Configuration du serveur NIS :

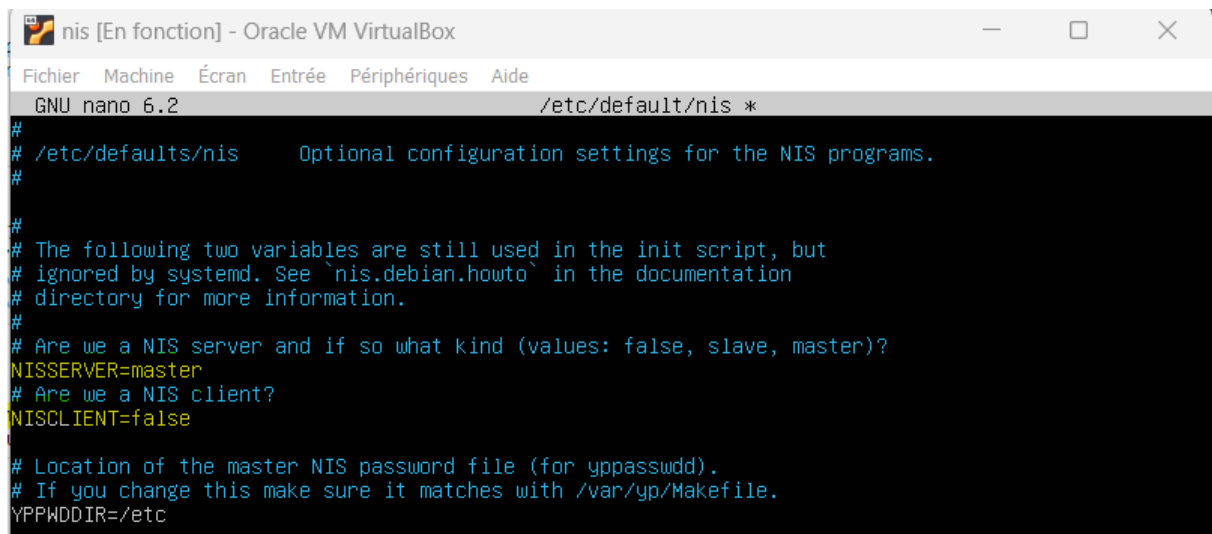
Définition du domaine nis



```
nis [En fonction] - Oracle VM VirtualBox
Fichier Machine Écran Entrée Périphériques Aide
GNU nano 6.2 /etc/defaultdomain *
youssef.ma_

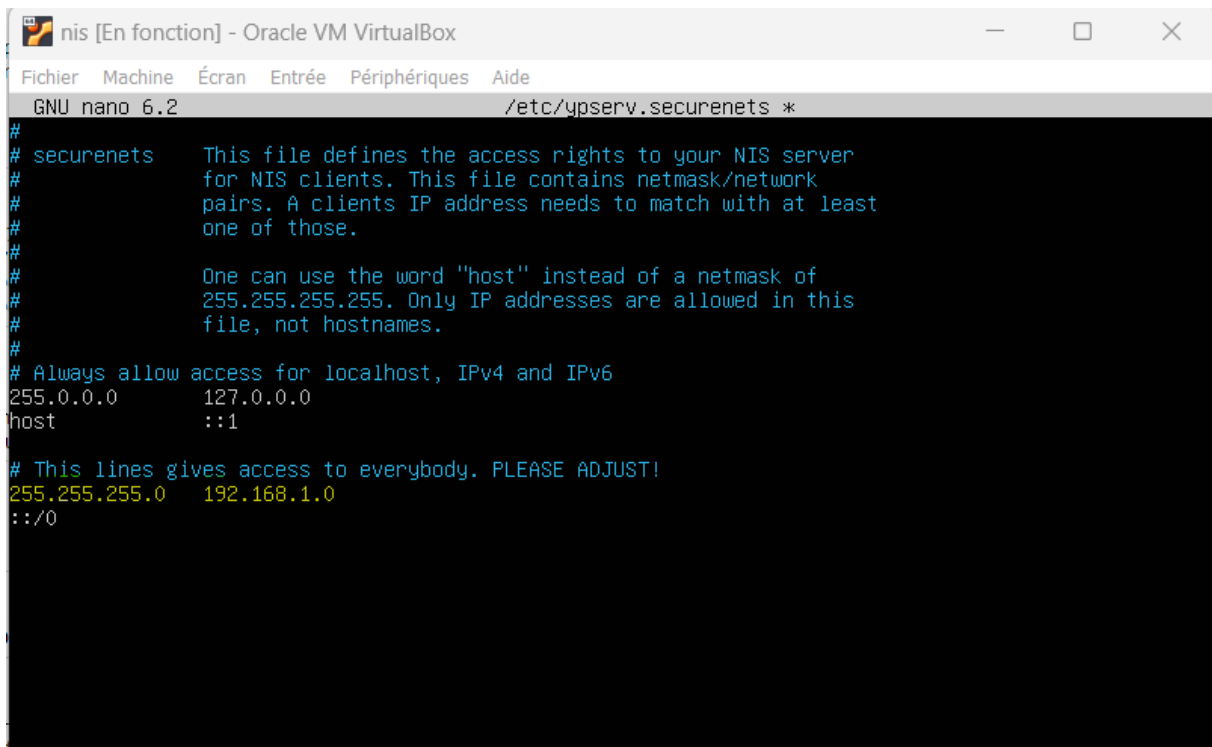
[ New File ]
Help Write Out Where Is Cut Execute Location M-U Undo
Exit Read File Replace Paste Justify Go To Line M-E Redo
```

Définit le serveur nis qu'il est master



```
nis [En fonction] - Oracle VM VirtualBox
Fichier  Machine  Écran  Entrée  Périphériques  Aide
GNU nano 6.2 /etc/default/nis *
#
# /etc/default/nis    Optional configuration settings for the NIS programs.
#
#
# The following two variables are still used in the init script, but
# ignored by systemd. See `nis.debian.howto` in the documentation
# directory for more information.
#
# Are we a NIS server and if so what kind (values: false, slave, master)?
NISSERVER=master
# Are we a NIS client?
NISCLIENT=false
# Location of the master NIS password file (for yppasswdd).
# If you change this make sure it matches with /var/yp/Makefile.
YPPWDDIR=/etc
```

Limitation de l'accès aux clients de réseau 192.168.1.0/24



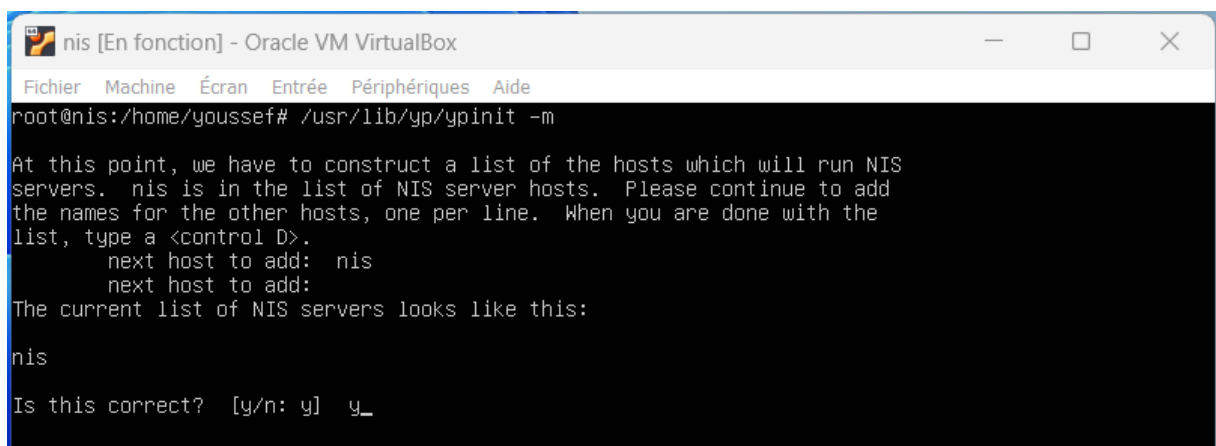
```
nis [En fonction] - Oracle VM VirtualBox
Fichier  Machine  Écran  Entrée  Périphériques  Aide
GNU nano 6.2 /etc/ypserv.securenets *
#
# securenets    This file defines the access rights to your NIS server
#               for NIS clients. This file contains netmask/network
#               pairs. A clients IP address needs to match with at least
#               one of those.
#
#               One can use the word "host" instead of a netmask of
#               255.255.255.255. Only IP addresses are allowed in this
#               file, not hostnames.
#
# Always allow access for localhost, IPv4 and IPv6
255.0.0.0      127.0.0.0
host           ::1
# This lines gives access to everybody. PLEASE ADJUST!
255.255.255.0  192.168.1.0
:::/0
```

Redémarrage de service

```
root@nis:/home/youssef# systemctl restart yperv
root@nis:/home/youssef# systemctl status yperv
● yperv.service - NIS/YP (Network Information Service) Server
   Loaded: loaded (/lib/systemd/system/yperv.service; disabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-03-21 04:34:31 UTC; 10s ago
     Process: 4538 ExecStartPre=/bin/domainname -F /etc/defaultdomain (code=exited, status=0/SUCCESS)
     Process: 4539 ExecStart=/usr/sbin/ypserv $YPSERVARGS (code=exited, status=0/SUCCESS)
    Main PID: 4542 (ypserv)
      Tasks: 1 (limit: 2221)
     Memory: 608.0K
        CPU: 5ms
    CGroup: /system.slice/yperv.service
            └─4542 /usr/sbin/ypserv

mars 21 04:34:31 nis systemd[1]: Stopped NIS/YP (Network Information Service) Server.
mars 21 04:34:31 nis systemd[1]: Starting NIS/YP (Network Information Service) Server...
mars 21 04:34:31 nis systemd[1]: yperv.service: Can't open PID file /run/yperv.pid (yet?) after s
mars 21 04:34:31 nis systemd[1]: Started NIS/YP (Network Information Service) Server.
lines 1-16/16 (END)
```

Création des tables nis



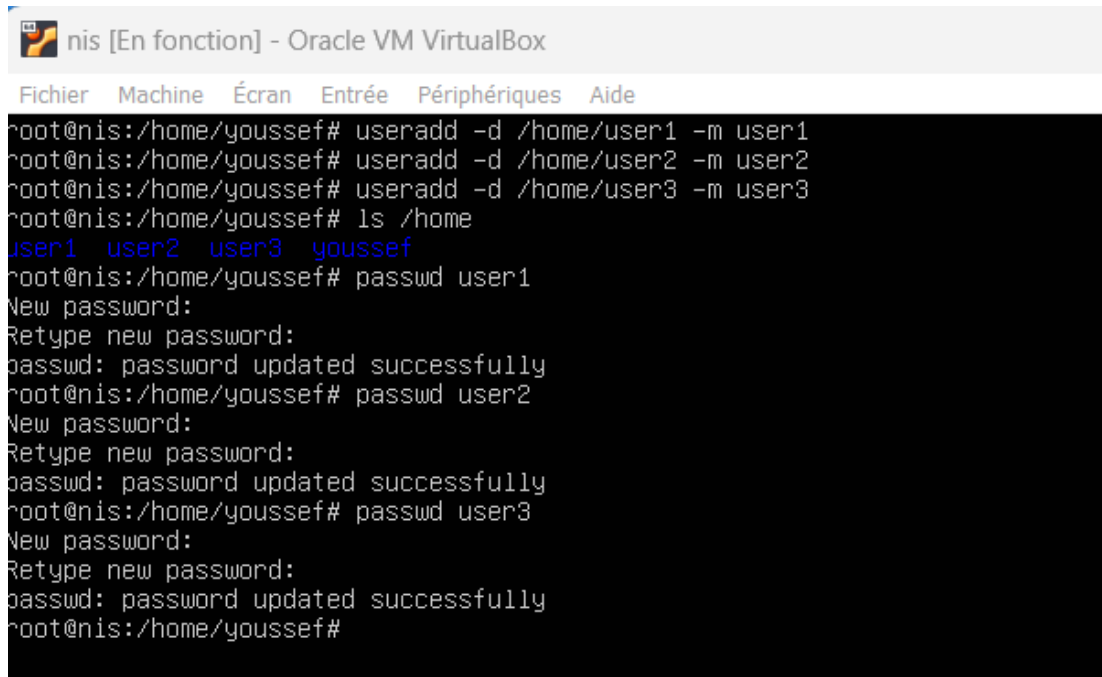
```
nis [En fonction] - Oracle VM VirtualBox
Fichier  Machine  Écran  Entrée  Périphériques  Aide
root@nis:/home/youssef# /usr/lib/yp/ypinit -m

At this point, we have to construct a list of the hosts which will run NIS
servers. nis is in the list of NIS server hosts. Please continue to add
the names for the other hosts, one per line. When you are done with the
list, type a <control D>.
    next host to add: nis
    next host to add:
The current list of NIS servers looks like this:

nis

Is this correct? [y/n: y] y_
```

Création des comptes utilisateurs




```
nis [En fonction] - Oracle VM VirtualBox
Fichier  Machine  Écran  Entrée  Périphériques  Aide
root@nis:/home/youssef# useradd -d /home/user1 -m user1
root@nis:/home/youssef# useradd -d /home/user2 -m user2
root@nis:/home/youssef# useradd -d /home/user3 -m user3
root@nis:/home/youssef# ls /home
user1 user2 user3 youssef
root@nis:/home/youssef# passwd user1
New password:
Retype new password:
passwd: password updated successfully
root@nis:/home/youssef# passwd user2
New password:
Retype new password:
passwd: password updated successfully
root@nis:/home/youssef# passwd user3
New password:
Retype new password:
passwd: password updated successfully
root@nis:/home/youssef#
```


Vérification de la Création des comptes utilisateurs

```
root@nis:/home/youssef# cat /etc/passwd |tail -10
tss:x:110:116:TPM software stack,,,:/var/lib/tpm:/bin/false
landscape:x:111:117::/var/lib/landscape:/usr/sbin/nologin
fwupd-refresh:x:112:118:fwupd-refresh user,,,:/run/systemd:/usr/sbin/nologin
usbmux:x:113:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
youssef:x:1000:1000:dhcp:/home/youssef:/bin/bash
lxd:x:999:100::/var/snap/lxd/common/lxd:/bin/false
_rpc:x:114:65534::/run/rpcbind:/usr/sbin/nologin
user1:x:1001:1001::/home/user1:/bin/sh
user2:x:1002:1002::/home/user2:/bin/sh
user3:x:1003:1003::/home/user3:/bin/sh
root@nis:/home/youssef# _
```

La mise-à-jour des tables nis



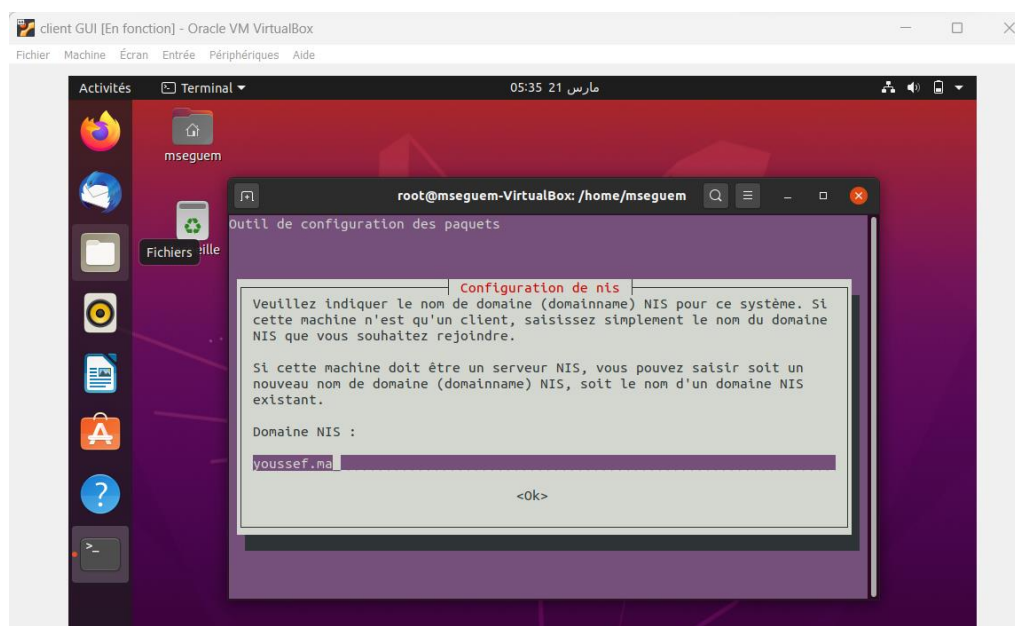
```
root@nis:~# cd /var/yp
root@nis:/var/yp# make
gmake[1]: Entering directory '/var/yp/youssef.ma'
Updating passwd.byname...
Updating passwd.byuid...
Updating group.byname...
Updating group.bygid...
Updating netid.byname...
Updating shadow.byname...
gmake[1]: Leaving directory '/var/yp/youssef.ma'
root@nis:/var/yp#
```

Coté Client NIS

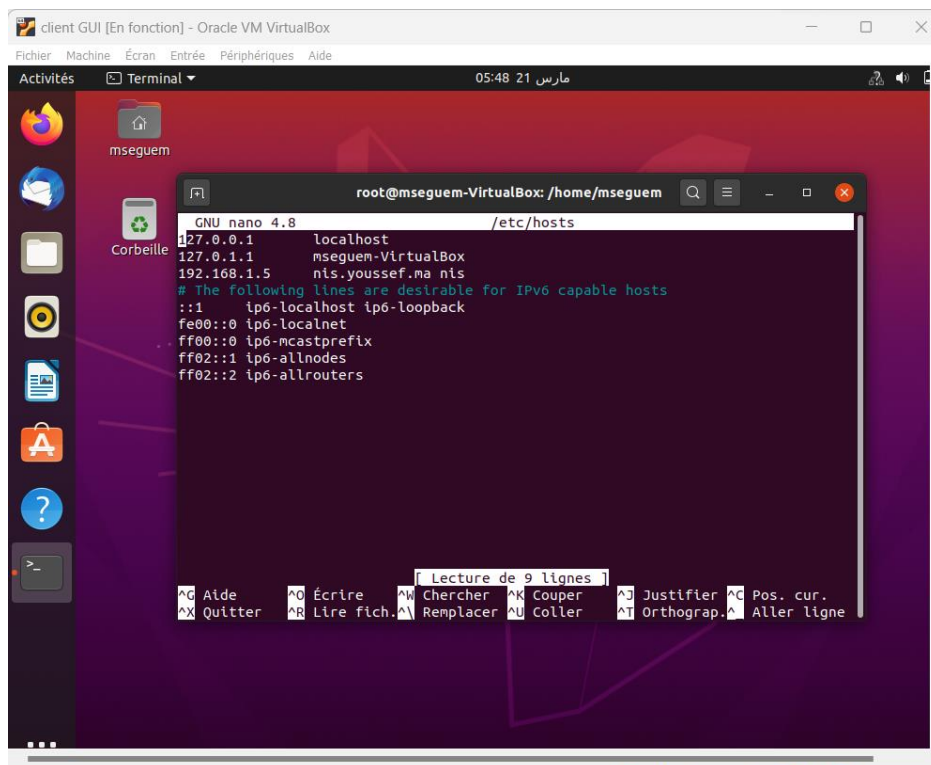
On a installé aussi le service nis à l'aide de la commande :

apt-get install nis

➤ Configuration du domaine NIS

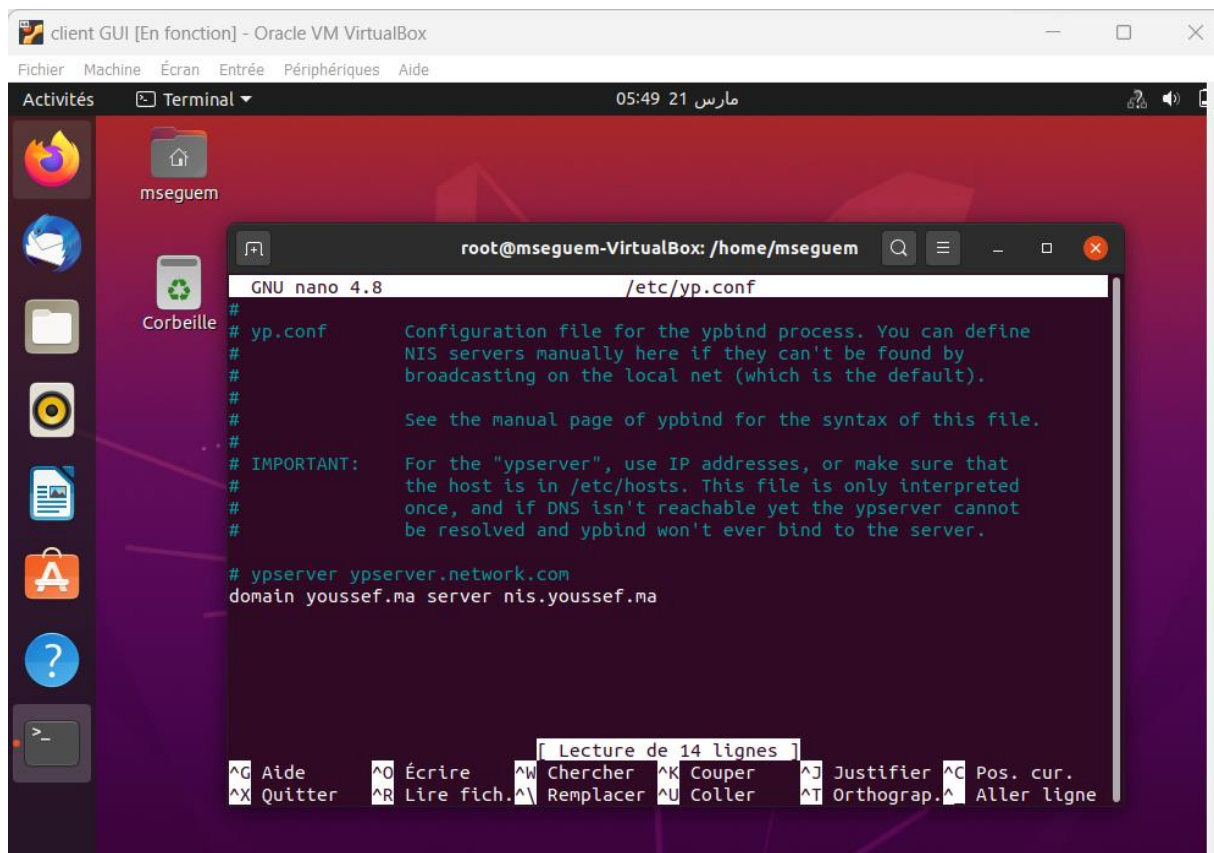


Ajouter le serveur nis et son @ip dans le fichier /etc/hosts du client nis:



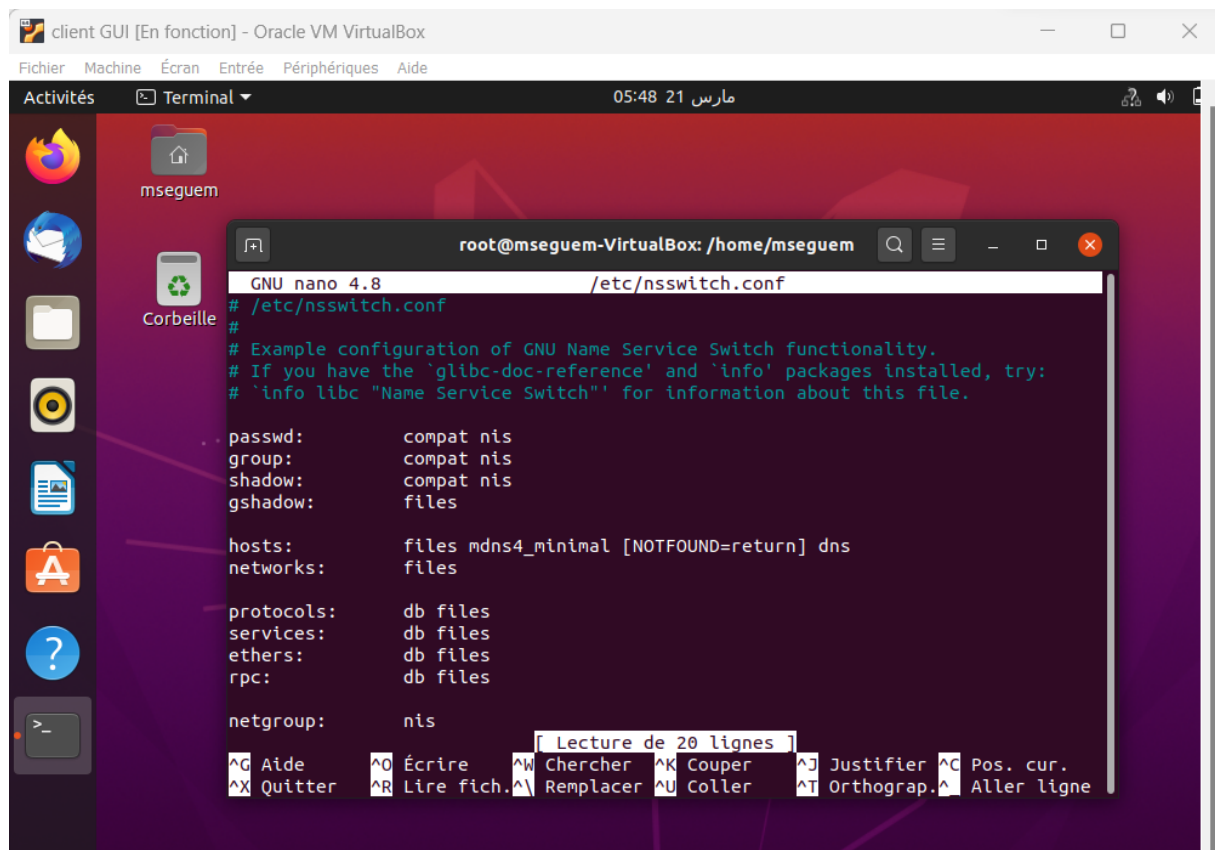
```
GNU nano 4.8 /etc/hosts
127.0.0.1 localhost
127.0.1.1 msegum-VirtualBox
192.168.1.5 nis.youssef.ma nis
# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

Ajouter le serveur nis et le domaine dans le fichier /etc/yp.conf



```
GNU nano 4.8 /etc/yp.conf
#
# yp.conf Configuration file for the ypbind process. You can define
# NIS servers manually here if they can't be found by
# broadcasting on the local net (which is the default).
#
# See the manual page of ypbind for the syntax of this file.
#
# IMPORTANT: For the "ypserver", use IP addresses, or make sure that
# the host is in /etc/hosts. This file is only interpreted
# once, and if DNS isn't reachable yet the ypserver cannot
# be resolved and ypbind won't ever bind to the server.
#
# ypserver ypserver.network.com
domain youssef.ma server nis.youssef.ma
```

Indique les fichiers qui vont Synchronisé avec le serveur



The screenshot shows a Linux desktop environment with a terminal window open. The terminal is running the nano text editor, editing the file /etc/nsswitch.conf. The file contains configuration for Name Service Switch (NSS) functionality. The configuration is as follows:

```
# /etc/nsswitch.conf
#
# Example configuration of GNU Name Service Switch functionality.
# If you have the 'glibc-doc-reference' and 'info' packages installed, try:
# 'info libc "Name Service Switch"' for information about this file.

passwd:          compat nis
group:           compat nis
shadow:         compat nis
gshadow:        files

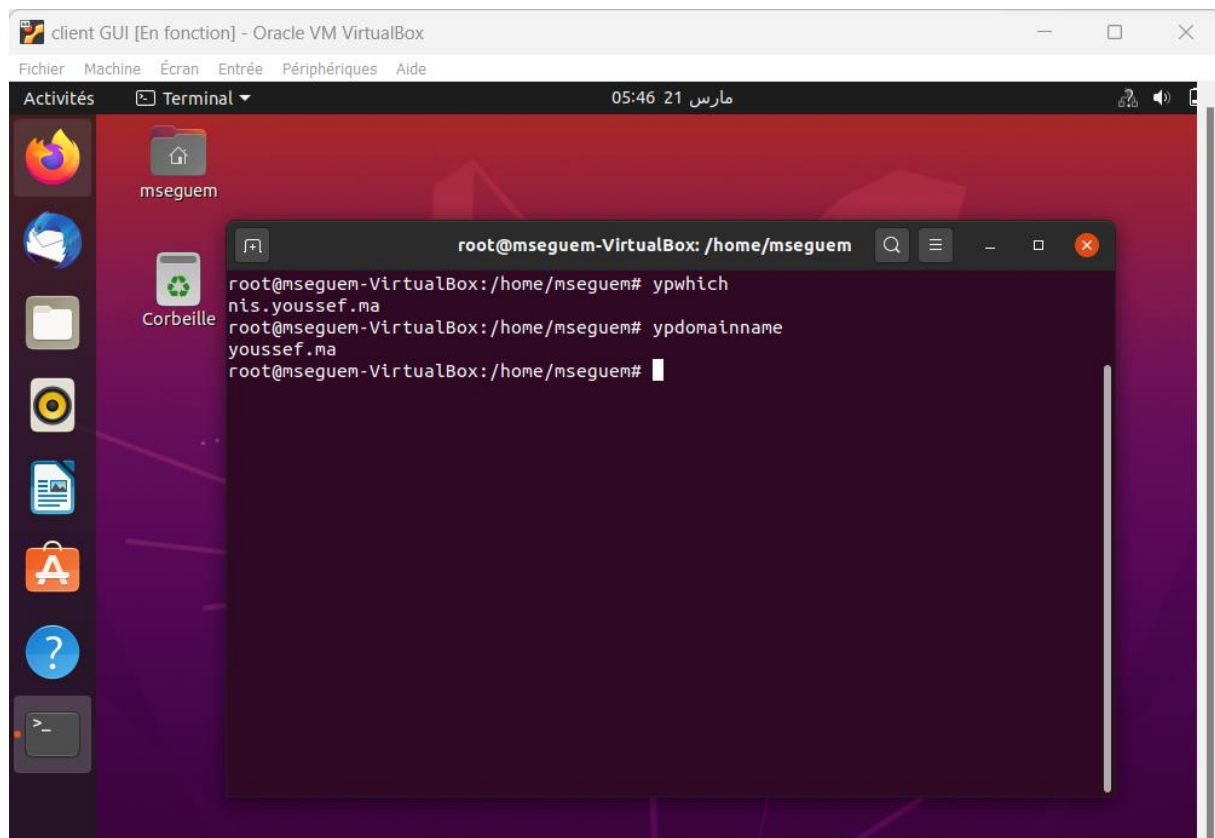
hosts:          files mdns4_minimal [NOTFOUND=return] dns
networks:       files

protocols:      db files
services:      db files
ethers:        db files
rpc:           db files

netgroup:      nis
```

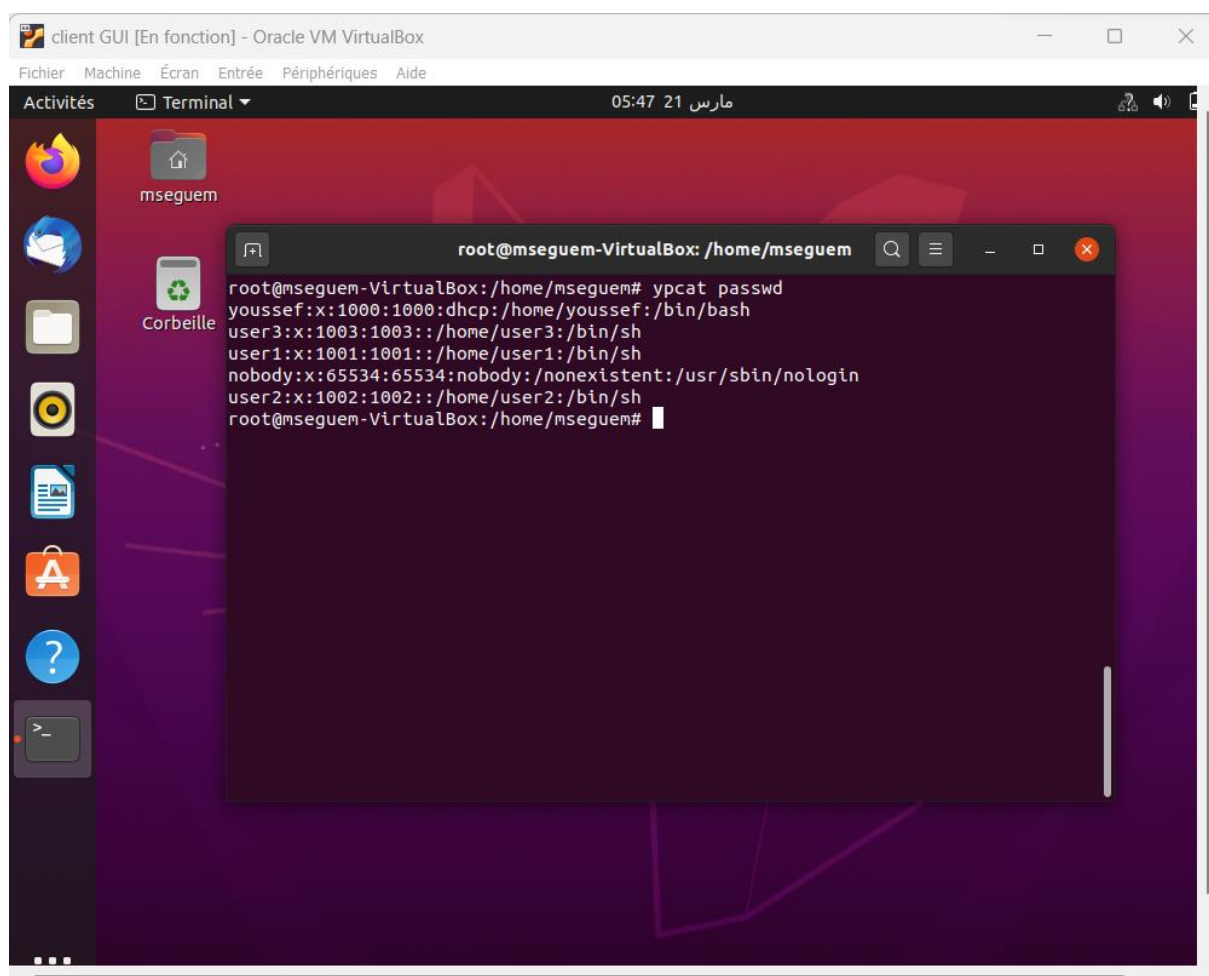
The terminal window title is "root@mseguem-VirtualBox: /home/mseguem". The desktop environment shows a sidebar with icons for applications and a top bar with the date and time (05:48 21 مارس).

Vérification



The screenshot shows the same Linux desktop environment as the previous one, but the terminal window is now running the command `ypwhich` to verify the NSS configuration. The output of the command is `nis.youssef.ma`. The terminal window title is "root@mseguem-VirtualBox: /home/mseguem". The desktop environment shows a sidebar with icons for applications and a top bar with the date and time (05:46 21 مارس).

Le client a réussi de récupérer les comptes configurés dans le serveur



The screenshot shows a Linux desktop environment within an Oracle VM VirtualBox window titled "client GUI [En fonction] - Oracle VM VirtualBox". The desktop has a dark purple background with a sidebar on the left containing icons for Firefox, a mail client, a file manager, a terminal, and a help icon. The top panel shows the "Terminal" menu and the date "05:47 21 مارس". A terminal window titled "root@mseguem-VirtualBox: /home/mseguem" is open, displaying the output of the command "ypcat passwd". The output lists system and user accounts with their respective UID, GID, and home directories.

```
root@mseguem-VirtualBox: /home/mseguem# ypcat passwd
youssef:x:1000:1000:dhcp:/home/youssef:/bin/bash
user3:x:1003:1003::/home/user3:/bin/sh
user1:x:1001:1001:/home/user1:/bin/sh
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
user2:x:1002:1002:/home/user2:/bin/sh
root@mseguem-VirtualBox: /home/mseguem#
```